NOVEMBER 30TH, 1855. (Stated Meeting.)

GEORGE PETRIE, LL.D., VICE-PRESIDENT,
in the Chair.

THE Secretary of the Council read the following recommendation of the Council, and moved—"That the Academy do repeal the By-Law, Chapter VII., Section 6, viz.:—

"'In case of the sickness or absence of any Member of a Committee, to be signified to the Secretary of Council, that Member of such Committee shall nominate a Member, *pro tempore*, out of the names which have been proposed by the Council to fill the Committees, and which have not been elected; the Member's nomination shall then be signified to him by the Secretary of Council; and in case the President shall approve such nomination, such Member *pro tempore* shall be vested with all the powers of a Member of Council.'"

Moved by Rev. G. S. Smith, D.D., seconded by J. M. Neligan, M.D., and—

RESOLVED—That the consideration of this question be adjourned to the Stated Meeting of the 16th March next.

The Secretary of the Council read a paper, by the Rev. George Salmon, on Reciprocal Surfaces.

"The object of this paper will be better understood by first stating the corresponding problems for plane curves, and the solution which has been given for them.

"If the *degree* (m) of a curve be estimated by the number of points in which it meets an arbitrary line, and the *class* (n) of a curve by the number of tangents which can be drawn to it from an arbitrary point, then it is known that the degree of the curve is equal to the class of the reciprocal curve, and *vice versa*, and that the latter is in general derived

from the former by the formula $n = m(m-1)$. But this led to the paradox, that if we formed by the same rule the degree of the reciprocal of the reciprocal, instead of falling back on the number m, as we plainly ought, we should obtain a much larger number $[(m^2-m)(m^2-m-1)]$. The difficulty was explained by showing that the degree of the reciprocal of a curve is diminished when the curve has multiple points; and the full examination of the subject showed that a curve of the m^{th} degree has in general a certain determinate number of points of inflexion and double tangents, each of which gives rise to a multiple point on the reciprocal curve.

"The corresponding problems for surfaces were, I believe, first investigated in a paper which I contributed to the 'Cambridge and Dublin Mathematical Journal' in the year 1846, in which I gave the first outlines of a theory, the completion of which I now lay before the Academy.

"In the following paper I first investigate the degree of the reciprocal of a surface of the m^{th} degree, and examine how that degree is affected when the surface has multiple points or lines.

"The first application of the theory is made to the case of developable surfaces. The reciprocal of a developable is a curve of double curvature, which is to be considered as a surface of degree (0). It furnishes then a test of the theory to examine whether it explains why, when the surface is a developable, this reduction takes place in the degree of its reciprocal. And this explanation is successfully obtained.

"I next show that a surface has a number of stationary and double tangent planes, whose points of contact lie on a certain locus, the degree of which is investigated. The surface has also a certain determinate number of triple tangent planes. Every one of these multiple tangent planes gives rise to a multiple point on the reciprocal surface.

"In the next place, having in the preceding section determined the number of multiple points and lines on the reci-

procal surface, I apply to it the general theory, and show how it is that the degree of the reciprocal of that reciprocal reduces to *m*.

"Finally, I apply the theory to the case of ruled surfaces, for which it is easy to see that the degree of the reciprocal is always equal to the degree of the surface, and I show how it follows from the general theory that this is the case."

The paper was referred to the Council for publication.

Parke Neville, Esq., presented some specimens of peat-moss, and part of a rope or cable, formed of heath, found about ten feet under the surface of the street, in an excavation made lately in St. Michael's Hill, opposite the western entrance of Christ Church, Dublin.